

Case Study 4

Tillamook Farm

Location: Tillamook County, zip code 97141
Adjacent to the west side of the city of Tillamook, Oregon

Description: Confined dairy operation with manure application to fields

- General:
- ~208 total acres
 - 189 acres - pasture
 - 10 acres – farmstead/headquarters
 - 9 acres – wildlife habitat
 - Dairy herd 590 Holstein (1,000 lb animal units)
 - 400 Milkers
 - 15 Dry Cows
 - 125 heifers
 - 124 heifer calves
 - Produces 80 pounds of milk per cow per day
 - All farm access roads are graveled
 - Feed (grain, corn silage, and alfalfa hay) are imported from outside the county
 - Lactating and dry cows are confined for 212 days and on pasture for 153 days per year
 - Heifers are confined for 197 days and on pasture for 168 days per year
 - Calves are confined for 365 days per year
 - Incandescent lights in the barns and milking parlor
 - No fans in the barns or milking parlor
 - Propane is used to heat water
 - All pumps, agitators, and the milking parlor are electric
 - Mortalities are picked up by the Tillamook County Creamery Association daily (when needed)

Manure Handling:

- Lactating cow manure is handled as 30% solids and 70% liquids
- Other manure is handled as 100% solids
- Parlor waste is gravity fed to a 40 ft by 8 ft below-ground liquid storage tank
- Manure from the confinement building is scraped to a 1,500 gallon liquid storage tank and then pumped to a 100 ft by 16 ft above-ground liquid storage tank
- Solids are stored on a roofed concrete pad
- A manure spreader is used to apply the solid manure to the pastures. Solid manure is not incorporated.

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- Liquid manure is applied via a Big Gun system to all pastures, except the eastern-most pasture just southeast of town. Liquid manure is not incorporated.

- Pasture:
- Pastures are grazed between April 15th and October 31st.
 - Typical forage yield is 6 tons dry matter at 20% protein per acre per year
 - No commercial fertilizer is used

Landowner Objective:

- Farmer is interested in saving energy on his dairy due to the increasing energy prices.
- Farmer is interested in developing some carbon credits.
- Farmer is interested in developing a CNMP that includes air emissions.
- Farmer has received odor complaints and would like to address this issue.

Additional Information:

- There are a number of dairy operations and manure storage tanks in the Tillamook area (see map). Odors from manure storage and application are prominent in the area and are a source of discontent from the surrounding community.
- The Port of Tillamook has an existing dairy manure digester. They are always looking for additional sources of manure to feed the digester.
- The dairy is located in a drainage district, is diked, and has pumping stations and tide gates. Flooding and a high water table are issues.

Air Quality and Atmospheric Change

Airshed and On-Farm Assessment Steps

1. Airshed Assessment: Meteorology/Climatology/Topography/Landscape:
 - Briefly describe the topography and landscape characteristics of the farm in question (see topo sites on web reference handout sheet, or others). Get a rough sense about the area of the farm and regions outside the farm, at various scales—familiarize yourself with the farm situation with regard to potential airsheds and watersheds
 - Briefly describe the possible weather and climate factors that may influence the air quality impacting the farm. At a minimum this should include:
 - Examine the relevant wind roses for at least several months
 - Examine a temperature, humidity and precipitation summary for a nearby location, including information on inversion potential
2. Airshed Assessment: Pollutant Formation and Sources, and Resource Concerns
 - Briefly review and document the potential agricultural air emissions of importance (as presented in class)
 - Briefly review NRCS AQAC resource concern components and quickly hypothesize about how each may be relevant to this farm situation
 - Briefly examine the emissions sources outside the farm that may affect the farm's management of air emissions, and describe how these relate to NRCS AQAC resource concerns. Emission sources nearby and those at distance that may be of concern
3. Airshed Assessment: Relevant Regulations and Receptors
 - Is the farm in a nonattainment area for a criteria pollutant? If so, identify and document these
 - Are there any nearby federally-protected Class I Areas? If so, identify and document these
 - Are there any federal, state, regional, and/or local air quality regulations of concern to this operation? If so, identify and document these.
 - Examine the nearby area for receptors of concern and document these (include schools, hospitals, residences, retail, roads, others?)
4. On-Farm Assessment:
 - Trust your senses, especially sight and smell. Observe not only existing air quality issues, but also situations which could lead to or indicate a potential air quality problem. Record these observations.
 - Identify and evaluate on-farm sources of air emissions of concern
 - Location, location, location. How does this affect this operation?
 - Use the AQAC On-Farm Assessment Checklists to evaluate potential sources and emissions
 - Use appropriate AQAC tools to evaluate emissions, options, etc. (COMET-VR, SNAP, others)

- If interested in carbon sequestration in soils and vegetation, evaluate predicted carbon storage with current management using COMET-VR, then make an additional run to predict changes on carbon storage with changes in land management
- Rank these emissions and sources by their importance relative to conservation and regulatory goals (manage to be “out of control”): Prioritize actions!
- Design conservation activities/practices/systems to specifically address these actions and outcomes. Consider specific practice standards that may be relevant Look for synergies – be efficient!
- Think about how these conservation activities/practices/systems may impact other resources (i.e., SWAPA+H and Energy?)
- Review and recommend specific NRCS Programs to implement AQAC practices/activities

Reference material:

- Website References for AQAC Information
- AQAC Definitions and Acronyms
- AQAC Activity-Practice List
- AQAC Practice Standards Air Check
- AQAC On-Farm Assessment Checklists

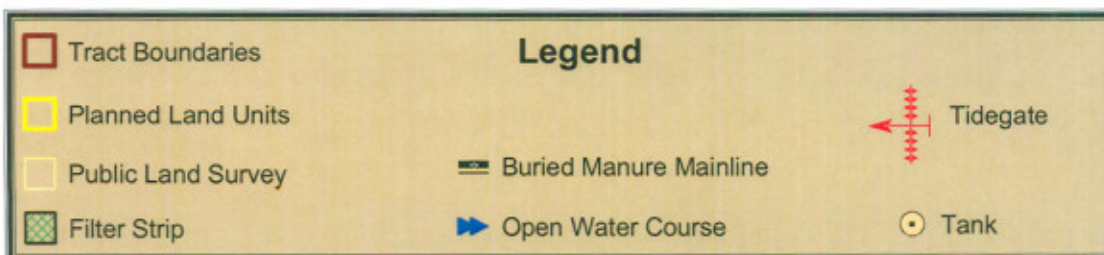
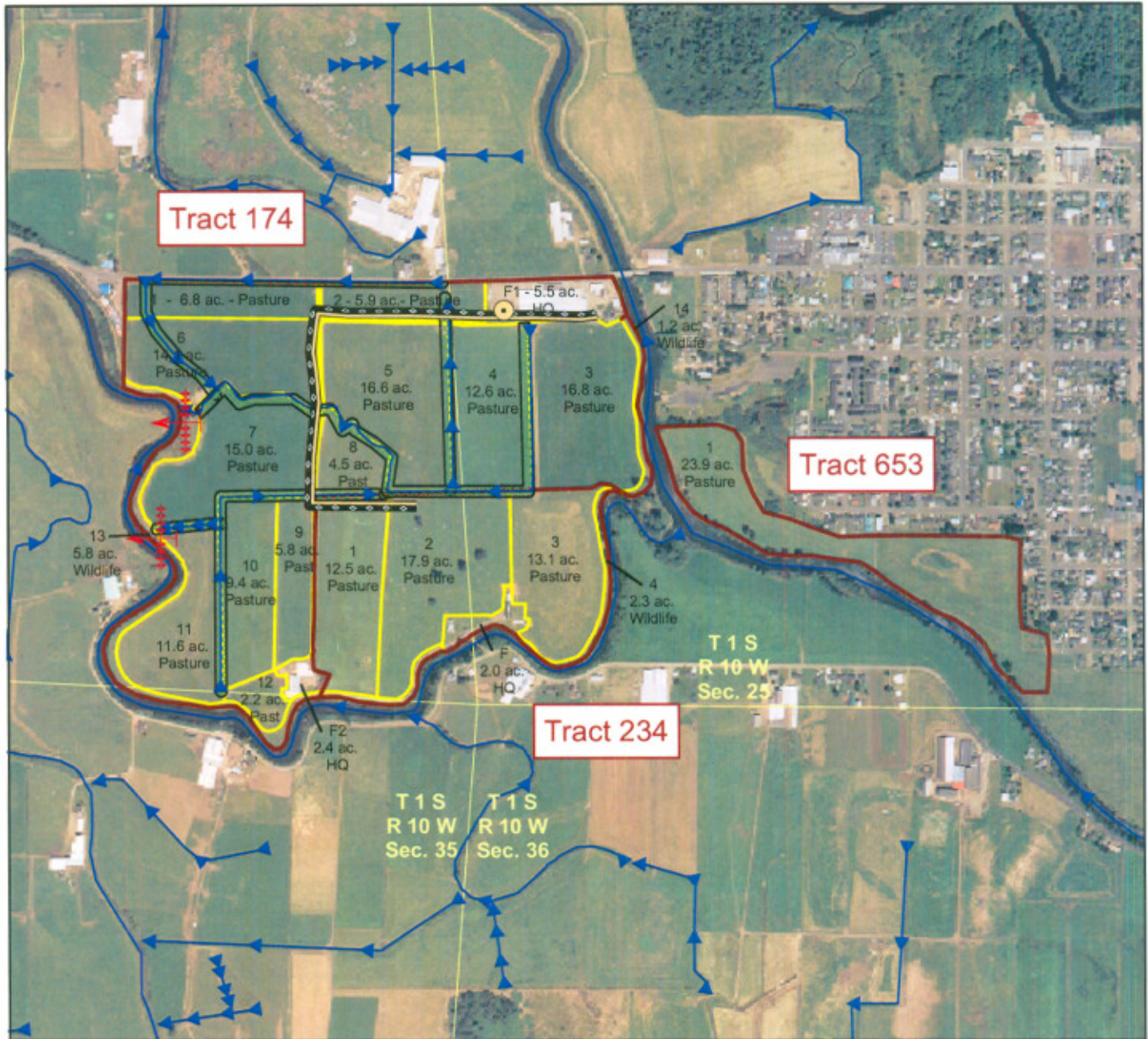
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Energy Exercise Directions

1. Considering the landowner's objectives and concerns, identify the activities on the operation that use significant amounts of energy.
2. Identify alternatives to the above activities that can help the landowner save energy.
3. Run the dairy energy awareness tool to estimate energy use and potential savings for this operation.
4. Identify renewable energy opportunities for this farm.
5. Summarize your recommendations in a report for the group.



Tillamook County SWCD
Approximate Acres: 207.9
Date: 1/19/2007

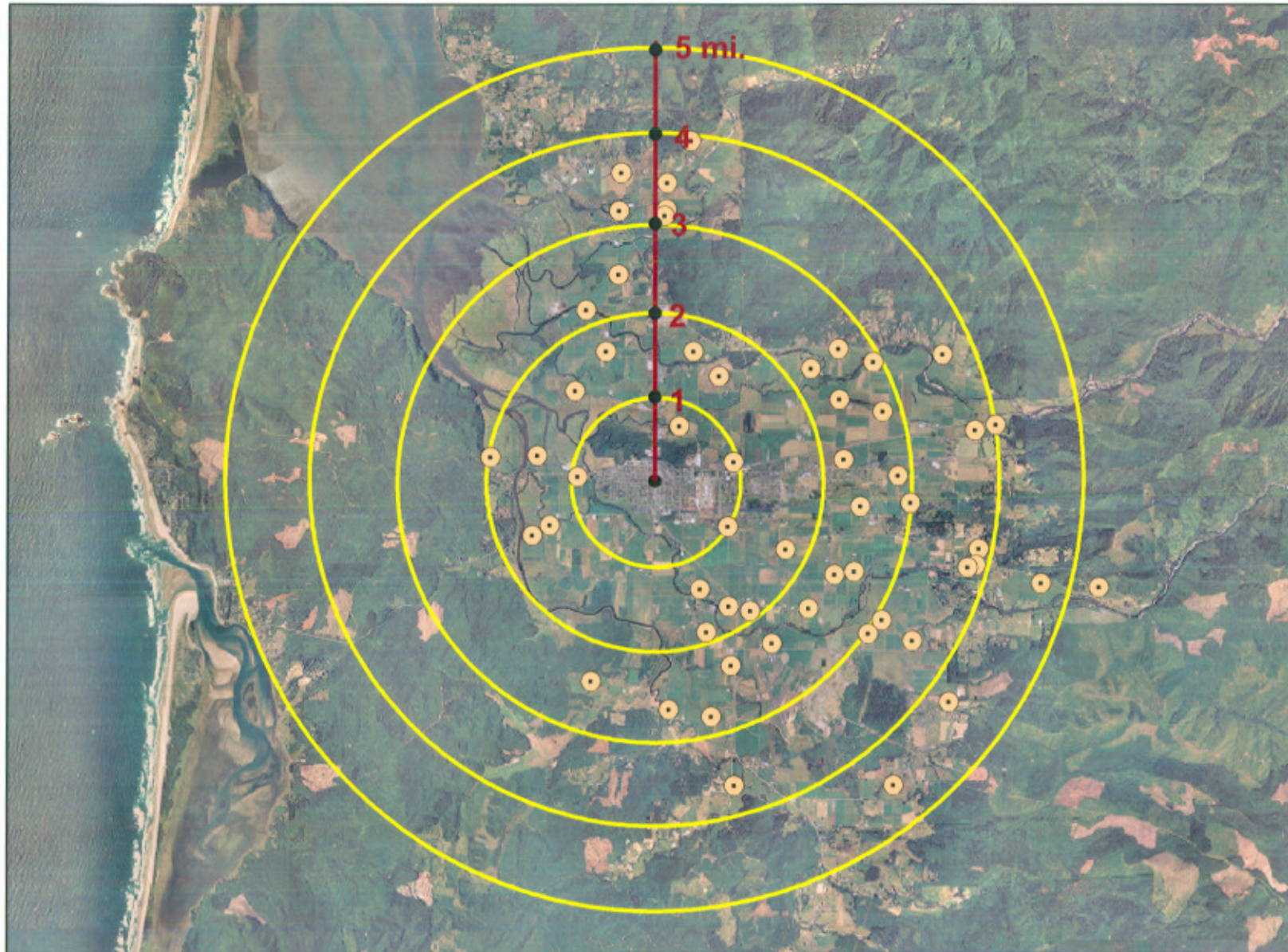
Conservation Plan Map 1 of 3



Animal Waste Storage Tanks 5 Mile Radius of Tillamook

TILLAMOOK SERVICE CENTER
USDA - NRCS
TILLAMOOK COUNTY, OREGON

Date: 6/28/2007



Legend

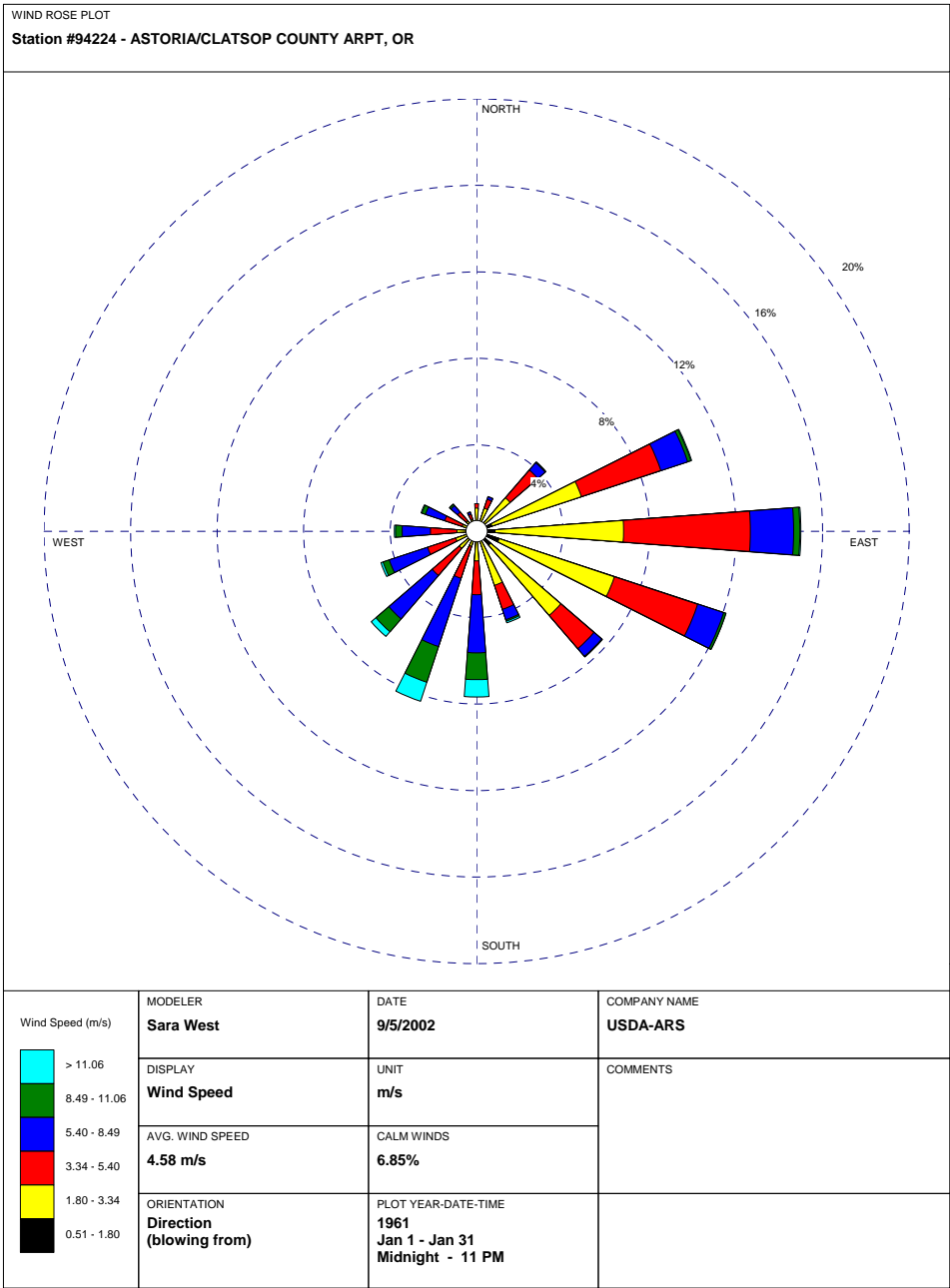
- Tanks
- Mile Increments



5,000 0 5,000 10,000 15,000 20,000
feet



January Wind Rose for Astoria



July Wind Rose for Astoria

